

General Certificate of Secondary Education
Design and Technology (Product Design)

A554

Unit A554: Designing Influences

Specimen Paper

Time: 1 hour 30 minutes

Candidates answer on the question paper.

Additional materials: None

Candidate
Forename

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Candidate
Surname

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Centre
Number

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Candidate
Number

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INSTRUCTIONS TO CANDIDATES

- Write your name, Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each answer carefully and make sure you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do not write in the bar codes.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is 60.

FOR EXAMINER'S USE

1	
2	
3	
4	
5	
TOTAL	

This document consists of **15** printed pages and **1** blank page.

[Turn over

SECTION A

You are advised to spend 45 minutes on this section.

- 1 Fig. 1 shows a television remote control.

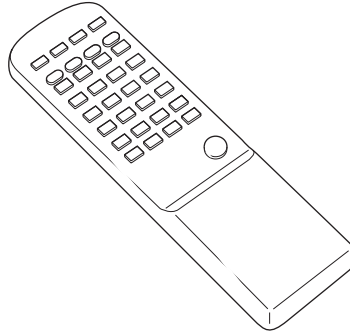


Fig. 1

- (a) Give **three** design features of television remote controls.

Feature 1 _____ [1]

Feature 2 _____ [1]

Feature 3 _____ [1]

- (b) (i) The television remote control has been designed with ergonomics in mind. Explain what is meant by the term 'ergonomics'.

 _____ [2]

- (ii) Give **two** pieces of anthropometric data that may have been used in the design of the television remote control.

1 _____ [1]

2 _____ [1]

- (c) Electrical products such as televisions and DVD players are usually produced in either silver or black.

Explain why designers choose to use these colours.

[3]

[Total: 10]

SPECIMEN

- 2 Fig. 2 shows a DVD case with a paper insert.

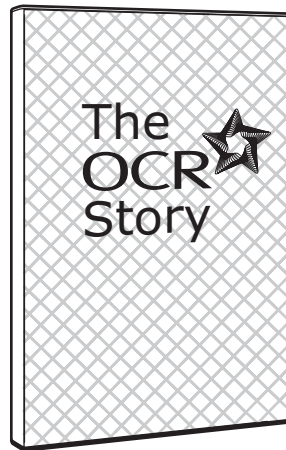


Fig. 2

- (a) Give **two** reasons why paper inserts are used in the DVD case rather than printing directly onto the surface of the case.

Reason 1 _____ [1]

Reason 2 _____ [1]

- (b) (i) State **three** functions of the DVD packaging.

1 _____ [1]

2 _____ [1]

3 _____ [1]

- (ii) Choose **one** of your answers from (b)(i).

Function

Explain how the DVD packaging achieves this stated function.

[2]

- (c) DVDs have become very popular in recent years and as a result some high street stores no longer sell video recorders.

Discuss the implications to consumers of DVDs replacing video recorders.

[3]

[Total: 10]

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- 3 Fig. 3 shows a modern hairdryer and a hairdryer from the 1940's.

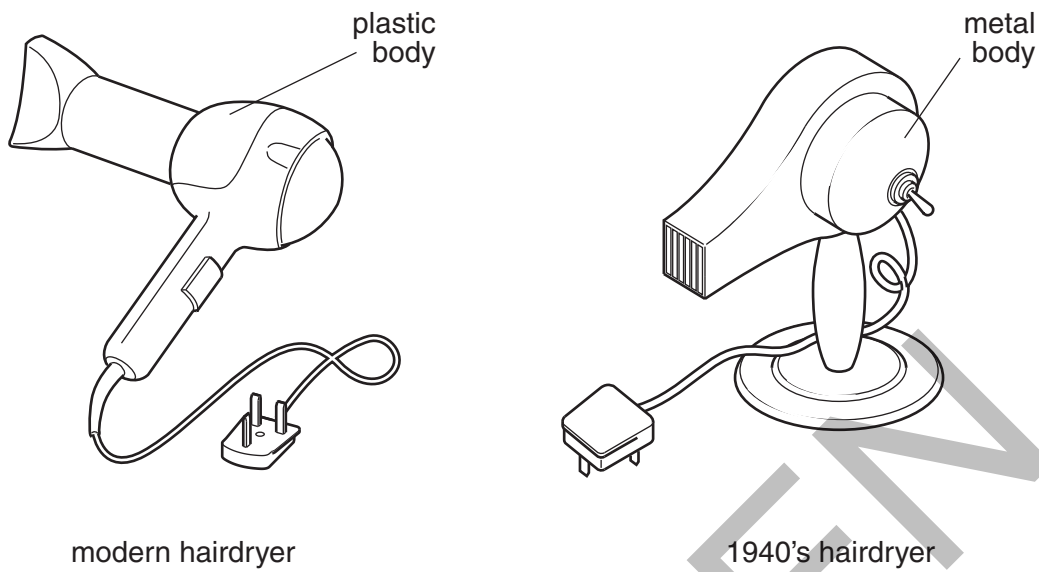


Fig. 3

- (a) Complete the diagram below by adding a further three successful features of the modern hairdryer.

The hairdryer has a powerful hot air blower

What are the successful features of the modern hairdryer

[3]

- (b) Explain why **two** of the features you have identified have made the modern hairdryer successful. An example has been done for you.

Point 1 The hairdryer has a powerful hot air blower.

Explanation: The hot air is blown with much greater force making it more effective at drying the hair.

(i) *Point 2* _____

Explanation

_____ [2]

(ii) *Point 3* _____

Explanation

_____ [2]

- (c) The two hairdryers shown in Fig. 3 both have the same basic function, however, their designs are very different.

Explain why the design of the hairdryer has changed over the years.

_____ [3]

[Total: 10]

8
SECTION B

This question draws upon the research you carried out as part of your examination preparation.

- 4** The table below shows the eras, trend setters and iconic products for this examination.

Please indicate using a [✓] the era or movement you have studied.

Era or Movement	Trend setter	Iconic product	✓
30s and 40s	Bakelite	Radio, TV or other domestic products made predominately in Bakelite	
30s	Harry Beck	London Underground map	
90s	Microchips	Mobile phone	
90s	Goretex	Sports clothing	
40s	British Government	War time rationing	

- (a)** Trend setter chosen

Explain the importance of this trend setter.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

[4]

(b) Iconic product chosen

Explain why the product you have chosen has been so influential. Make specific reference to design, innovation and function.

[6]

[Total: 10]

5 This question draws upon the research you carried out as part of your examination preparation.

You will need to:

- Write a specification;
- Produce a range of initial ideas;
- Develop **one** idea;
- Give details of the final proposal.

Five different design needs are given below.

Please indicate using a [✓] **one** design need you are going to consider.

	design need	✓
Food	Using some or all of the ingredients given from the war time ration (below) design a two course meal for a family of six.	
	Bacon and ham	
	Meat	
	Cheese	
	Margarine	
	Butter	
	Milk	
	Sugar	
	Jam	
	Tea	
	Eggs	
	Flour and yeast	
	Vegetables + fruit	
Textiles	A pair of 'Goretex' gloves for a sport of your choice.	
Graphics	A point of sale display (POSD) is required to publicise a 1930's murder mystery evening. The POSD must reflect the graphic style of the era.	
Resistant materials	A company that produces office equipment requires a design for a desk tidy based upon 30s and 40s bakelite products.	
Electronics	An electronic product for teaching young children about 'AND' and 'OR' gates is required. The product must include lights and buzzers. Details of the electronic system must be given.	

(a) Identify the **four** most important design specification points for your chosen problem.

1 _____
_____ [1]

2 _____
_____ [1]

3 _____
_____ [1]

4 _____
_____ [1]

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- (b) Use sketches and notes to show your initial ideas to solve your chosen problem.

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- (c) Use sketches and notes to develop **one** of your initial ideas.

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- (d) Give details of your final proposal showing how it meets the four design specification points you identified in part (a) of this question.

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[6]

[Total: 20]

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**OXFORD CAMBRIDGE AND RSA
EXAMINATIONS**

General Certificate of Secondary Education

**DESIGN AND TECHNOLOGY
(PRODUCT DESIGN)**

A554

Unit A554: Designing Influences

Specimen Mark Scheme

The maximum mark for this paper is 60.

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Overarching Rationale Points

Marks should not be retrospectively awarded for items. E.g. Zero for part (a) but some relevant rewardable points in part (b). Reward accordingly in part (b) but do not credit for earlier part of question i.e. part (a)

Where candidates provide excess response: E.G. Two points asked for and four given, mark all four and reward up to two marks for correct points.

Crossed out responses: If legible reward if correct / rewardable response.

Question	Mark Scheme	Rationale
1a	attractive, modern looking, lightweight, ergonomic, comfort, ease of use / simple, colour, shape, size, layout, shape of buttons, logo, icons / symbols, infra-red, ultrasonic, battery operated [3]	Answers must relate to a TV remote control Do not accept functional points such as “you do not have to get up to change channels” If two points in one feature = 2 marks Accept 1 word answers if correct point given Button with some detail given (button on own no mark) Do not accept light needs to be lightweight Colour used for different features E.g. buttons & controller can be rewarded
1b(i)	Ergonomics is the study of how people interact with products and their environment - 1 mark for people and their environment , 1 mark for makes products/environments easy to use/more efficient/comfortable (candidates could give an example for this such as size, shape, weight) [2]	Answer does not have to refer to the remote control Must be referenced to user Anthropometrics reference alone no marks. When referenced to ergonomics reward accordingly. Do not accept “no sharp edges”

1b(ii)	any two from hand, digit / finger size, data on weight / user strength [1]	Answer does have to refer to the remote control Do not reward the application of the anthropometric data E.g. size of button Measurements must relate to the hand /
1c	answers should relate to functional items designed to fit into any environment, therefore must not clash with the décor, grey/black seen as 'classy', customers expect these items to be grey/black – coloured versions may be seen as inferior quality, helps to fashion proof – 1 mark for each point (2) + 1 mark for explanation [3]	Do not accept aesthetically pleasing, because they are electrical items, modern or references to manufacture. 2 points not explained = 2 marks maximum, if candidate gives more than 2 points maximum 2 points
2a	requirements: easier to print on paper, use of standardised package, easy to change / use case again, easier and cheaper to update design, low cost - 1 mark for each [3]	Ignore reference to recycling.
2b (i)	reasons could include answers that relate to: sell / display / attract users, protect, communicate, allows ease of storage / handling - 1 mark for each [2]	Must relate to DVD packaging.
2b (ii)	Appropriate point with explanatory detail [2]	No mark for the function. If different function (related to DVD) reward accordingly If previous part of question incorrect marks can still be achieved. Explanation must link point to how it achieves its function.
2c	Explanation should include : it is difficult to repair existing videos, video cassettes players less readily available, therefore forced to by DVD players in order to keep up, have to copy existing video library onto new media, concerns over disposal (environmental), planned obsolescence – people feel need to update / upgrade as technology advances, some users might find technology difficult to use. 1 mark for each [3]	Answers must be linked explicitly to issues around obsolescence: technological, planned and fashion. Answers must not relate to the functional benefits of DVD's or DVD players.

3a	<p>Better looking, more modern, lighter in weight, more ergonomic, more comfortable (ergonomic references), more efficient better insulation electrical and / or heat, easier to use, quieter in operation</p> <p>Accept functions: heat / cool selector, different fan speed, nozzle, thermal cut out, directional flow</p> <p>[3]</p>	<p>Do not accept “you can pick it up” because you can pick them both up”</p> <p>Give credit for easier to use because it does not have a stand.</p> <p>Plastic body needs qualification.</p> <p>Do not reward longer cord</p>
3b (i) & (ii)	<p>an explanation of two different points that justify the choice above. One mark for a simple explanation such as it is more lightweight, two marks for a detailed explanation such it is lighter in weight because lightweight plastics are now used 2x 2</p> <p>[4]</p>	<p>If feature in part (a) incorrect or absent explanation can be credited if fully explaining points</p>
3c	<p>Explanation should include: technological developments: manufacturing techniques, powerful motors, improvement in materials: new materials, lightweight, can with stand high temperatures, use of self colour,</p> <p>Production: injection moulding,</p> <p>More appealing to consumers / fashion trends</p> <p>2 points plus explanation</p> <p>[3]</p>	<p>Points must relate to why the product has changed not how (plastic has replaced metal so.....)</p> <p>2 points not explained = 2 marks maximum</p> <p>If candidate gives more than 2 points maximum 2 points</p>

4a	A clear explanation that identifies any two reasons - 1 mark for each point, 1 mark for each explanation. See grid below) [4]			Trend setter must be ticked or written. If answer is different from chosen trend setter no marks	
		Influence (legacy)	Innovation	Use of materials	Impact
	Bakelite	Birth of plastics, formed new shapes beyond the age	New technology, opened up the improvement of electrical safety in products	Created design opportunities	Lower cost products, more people to have products
	Harry Beck	Graphic information systems around the world based upon design principles	Simplification, user friendly	Primary colours, horizontal and vertical lines, consistent angles	People travel easier, design reproduced in many different media
	Microchips	Semiconductor technology enabled smaller, lighter products – social benefits such as medical, internet, travel communications	Telephony, communication use of semi-conductors such as silicon		Portable products and standalone, complex products manufactured cheaply – huge increase in technological obsolescence – led to greater efficiency
	Gore-Tex	New product produced – leisure industry and clothing	Waterproof and Breathable – use of composites and laminated textiles	Clothing, footwear →	High efficiency textiles, greater hygiene, lightweight clothing and products for leisure pursuits and sports
	Food	Rationing – ‘dig for victory’ (grow your own). campaigns, recipes provided, people to be responsible for health, basic nutritional guidelines	Creative use of a limited range of food	No waste, re-using of food materials for stock, broth etc	Nations health good – (obesity), publicity to promote food preparation. Ensuring minimum quality and standard for everyone

4b	3 different points clearly explained = 1 mark for each point + 1 mark for each justification (See grid below)		[6]	<p>Iconic Product must be ticked or written.</p> <p>Iconic Product can be different from 4a but answer must relate to Iconic product chosen.</p> <p>Marks must show the impact that the iconic product has had and not merely describe the product.</p>	
		Design	Innovation	Function	
	Radio TVs etc	Fashion/trends Desirability, smaller	Moulding methods that enabled new products and designs to be created	Use of plastic - ease of moulding, rounded shapes, split moulds, lightweight, portable	
	Underground map	Simple, easy to follow , representation rather than accuracy – user focused	Clear, equal spacing of stations, use of colour, sans serif typeface	Use of colours and symbols / easy to follow and use / has not required changes over time / can be used by any nationality / design copied world wide / has become the blueprint for transport systems	
	Mobile phone	Fashion/trends, use of colour/style, multiple use E.g. music, texting etc	Technology enables phones to be used for a variety of purposes,	Use of plastic - ease of moulding, rounded shapes, split moulds, lightweight, portable	
	Sports clothing	Fashionable, lightweight, youth culture	Used in a range of different environments including extreme conditions,	Explanation of how Gore-Tex works as a composite/laminate	
	War time rationing	It forced people to be innovative and self efficient, required them use initiative, focused upon nutrition, simple basic menus	Use of powdered ingredients for the mass market, use of preservatives	Reduced waste, improved nutrition, to ensure the health and well being of the nation, social implications – caring for one another	

5a	<p>1 mark for each key specification point – no marks awarded for points identified in the question</p> <p>Food: Appearance, nutrition, balance, ethical, enjoyment, taste, texture, speed of making</p> <p>Textiles: user, sport, properties, lightweight, ergonomics, comfort, maintenance / care,</p> <p>Graphics: material properties, target market, production techniques, location, 2D/3D, stable / sturdy</p> <p>Resistant Materials: stationery equipment, user, location, material properties, ergonomics, production,</p> <p>Electronics: electrical safety, power supply, ease of use, target market, production techniques</p> <p>[4]</p>	<p>If no tick in the box refer to parts 'b' –'d' to identify candidate focus.</p> <p>No marks for criteria lifted from design need e.g. 'based on '30's '40's Bakelite products E.g. radio</p> <p>Generic points E.g. aesthetically pleasing, cheap, durable, light, strong are not accepted.</p> <p>Accept one word points as long as they clearly relate to the design need E.g. Gortex Glove – comfortable and/or lightweight.</p>
5b	<p>initial ideas</p> <p>Only design solution with no accompanying notes [1]</p> <p>1 design solution with notes or more than 1 design with labels only [2]</p> <p>More than 1 design solution with notes [3]</p> <p>A range of design solutions that address at least two specification points [4]</p> <p>A creative approach to designing [5]</p>	<p>For electronic responses reward according to mark scheme even if an electronic system not shown.</p> <p>Where there are no specification points in 5a maximum marks available are 3</p> <p>For food except each course as a separate idea.</p>

5c	<p>development of ideas – <u>must</u> reflect the product focus</p> <p>One developed solution showing an idea from the initial ideas with some development - no notes [1] 1 developed idea with notes [2] Clear development of an idea [3] Notes that link to at least two specification points [4] A range of developments with notes that link to at least 3 specification Points [5]</p>	<p>In this part candidates must address the requirements of the “<i>design need</i>” and draw upon specific subject material knowledge.</p> <p>Where there are no specification points in 5a maximum marks available are 3</p> <p>For electronic responses a system must be shown.</p> <p>No marks to be awarded for aesthetic developments.</p> <p>To obtain full marks candidates must consider their own specification.</p>
5d	<p>final proposal</p> <p>A simple solution with limited detail/notes (1) A solution which meets the original design need with details of all components/parts (2) Full details showing how the design meets their specification point 1 Full details showing how the design meets their specification point 2 Full details showing how the design meets their specification point 3 Full details showing how the design meets their specification point 4</p> <p>[6]</p>	<p>For all areas accept justified points related to the candidates’ specification and any points given to the candidates in the “<i>design need</i>”. <i>E.g. Bakelite Radio, 30’s 40’s</i></p>